Official Newsletter of the Fort Vancouver Trades Guild

THE forge & plane

VOLUME VI, NUMBER 4 FALL 2006

F&P Interview
A Visit with Ralph Hinds

LONG TIME GUILD MEMBER Ralph Hinds has been blacksmithing since the third grade, when he was conscripted to help his older brother, Paul. That first blacksmithing experience, in Coos Bay, Oregon, led to less riveting jobs that took Ralph through high school and the Merchant Marine Academy, in Kingsport, New York. In World War II, Ralph served as a marine engineer aboard a U.S. Navy oil tanker in the Marshall Islands, and finished as a Lieutenant J.G. After the war he served in the Merchant Marine for nine years, then returned to Albany, in the Willamette Valley, in 1955. Ralph worked as a contractor from1955 until he formed his own company in 1970.

One of the biggest projects Ralph worked on was installing machinery — we're talking big hammers here — for what was then known as the Teledyne Wah Chang Albany plant (currently part of Allegheny Technologies, and known as OREMET-WAH CHANG). The company produces specialty metal products for many industries. Ralph undertook the intimidating task of working as an industrial installer for one of the highest-tech hammers here in the Pacific Northwest. This hammer, with four heads (a rotary forge), delivers 650 tons per hammer blow, working on metal at 1400° F. It will forge a 19-inch billet weighing about ten tons. The hammer remains in service today in the Albany plant. Ralph also installed a 2000-ton hydraulic forging press at the same plant.

Ralph Hinds (MIS Gawecki)

So Ralph can quote chapter and verse on hammers with a great deal of authority — from hammers made at his own Canadian Little Giant to the behemoths of modern industry. And, despite such a high-powered history, he is surprisingly casual about blacksmithing, apparently believing that anything can be accomplished with a little elbow grease and some ingenuity.

Ralph's current shop is the same shop he used for industial work before he retired,

and there's a fair amount of interesting stuff piled in the yard. The writer's personal favorite is some double-linked chain made from high nickel steel. Nooks and crannies in various outbuildings hold a treasure of fittings left over from industrial installations.

Ralph's forge exemplifies his talent for engineering and constructing. It has four independent gauges and features many clever devices. It uses preheated air for combustion, has both front and back doors to accommodate working extra-long stock, and it is even (somewhat) "portable." Ralph claims to have a photo from way back of a bemused Peter Ross examining all the gauges and levers.

Projects that Ralph has recently completed are a wishing well and gates for the front of his house in Albany, pictured below and at right. He has been an active member of NWBA for over twenty years and supports the Fort Vancouver Trades Guild in its mission of historical research, preservation, and interpretation. He is also a participating blacksmith on restoration of a 1925 privately owned locomotive, in Independence, Oregon. Ralph recently honored the guild by increasing his guild membership to the "patron" level.♦

Top: Wishing well detail
Right: Wishing well

Top: Ralph's steel stash
Bottom: Ralph's front gates

Photos: S. Gawecki

Photos: S. Gawecki

Merlyn Trotska
1920 – 2006

Forging by Merlyn?

Merlyn Trotska

THE GUILD SUFFERED a great loss with the departure of our friend and mentor Merlyn Troska, who died in Mesa, Arizona, November 7, during his yearly visit there. Merlyn was a founder of the Fort Vancouver Trades Guild and a volunteer at the Fort since 1990.

Merlyn's love of blacksmithing was a life-long committment. He first learned the trade in Fargo, North Dakota, and perfected it as a blacksmith for the U.S. Army, the Union Pacific, the Southern Pacific, and the Portland Terminal railways.

Merlyn had the ability, characteristic of only the finest artisans, always to make the work look simple and the material eager and willing. In his forging he exemplified how fluid and graceful form can be achieved with an economy of effort — something we all strive to imitate. We will miss Merlyn and remember him with fondness and perhaps even a bit of envy for the skill and experience that he brought to our blacksmithing community.♦

Mystery Artifact Solution

THE WINTER 2006 issue of *The Forge and Plane* reprinted a mystery artifact quiz from The Northwest Cultural Resources Institute Report for the Vancouver National Historic Reserve. The artifact, pictured again at left, is a pocket inkwell. Identifying artifacts from photographs isn't the best way: it's easy and a lot more fun to walk on over to the Archeology Department and look at the real thing.♦

From left
In the shop
Visiting the archives
Shel's hoe

Photos: S. Gawecki

Shelton Browder Demonstration

COLONIAL WILLIAMSBURG blacksmith Shelton Browder was at the shop for a three-day demonstration in early November. Shel, a fourteen-year veteran of the Anderson Forge at Williamsburg, has been a professional smith since 1985. In the workshop he duplicated objects from the Fort Vancouver archeological collection as well as making other period-appropriate items. Shel's constructions included a key, a foot adz, a cooper's adz (bowl adz), a hoe, a spade, and a forge-welded holdfast.

It was a pleasure to watch Shel work and observe his skill with a 4-pound hammer and his proficiency at forge welding. As he was constructing the hoe, he pointed out that there were no twists in the metal — something to remember when examining the artifact hoe on display at the Fort Vancouver blacksmith shop. Most of us just assumed that the hoe in the display case had been twisted on purpose, but Shel showed us "it ain't necessarily so." The guild welcomes any feedback from those who attended the workshop and learned from this outstanding demonstrator and teacher. ♦

Bob Race at NWBA

NWBA Fall Meeting

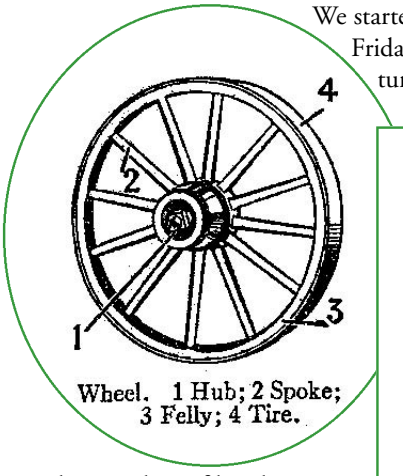
THE NORTHWEST BLACKSMITH Association held its fall meeting October 13-15. More than a few guild members took advantage of the opportunity to mingle with fellow NWBA members and swap ideas and tall tales. The library and the archive collection are always of interest at NWBA.The library has over 121 books and about 20 videos that circulate for a nominal fee. The archival collection contains work done by demonstrators at past NWBA functions. It is one of the most useful and comprehensive collections of blacksmithing techniques available. This fall, two guild members volunteered to be instructors for hands on workshops: Bob Race instructed beginners on forging a slitting chisel and Ken Mermelstein demonstrated the forging techniques of Uri Hofi. Great job Bob and Ken! ♦

Making Wooden Wheels: A Primer

Gary Lewis

RECENTLY I HAD THE opportunity to attend a class on wooden wheel making at the Oregon College of Art and Craft, thanks to generous help from a scholarship provided by the Fort Vancouver Trades Guild. Two other guild members, Hugh Eddy and Susan Gawecki, also participated in the workshop. I hope that this article will familiarize you with the general process we went through, with some of the tools we used, and with some wheel-making basics. As with any other craft, wheel-making expertise doesn't come in a weekend. About the most you can hope to gain in a weekend is a basic familiarity with the concepts and techniques.

The class was held over two weekends. We started with a Friday-night lecture, followed by two days of hands-on instruction in making a wheel. On Sunday of the following weekend, we fitted our wheels with the iron rims known as *tires* (or *tyres*). It was an excellent learning experience. The instructor, Rob Lewis, was very knowledgeable, with over twenty years' experience building horse-drawn vehicles. He has been a professional woodworker for most of his life and also does limited blacksmithing.

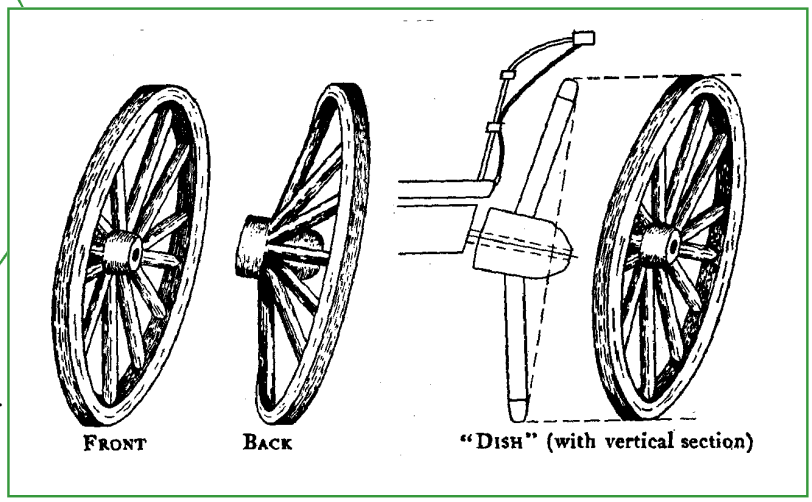


Wheel. 1 Hub; 2 Spoke; 3 Felly; 4 Tire.

First, the theory . . .

OUR FRIDAY NIGHT lecture began with a slide show that used many types of horse-drawn vehicles to illustrate various wheels. Rob explained the mechanics of the different wheels and how a wheel's purpose is reflected in its size and form. He also introduced the important concept of *dish*, which is the angle that the spokes hold the rim away from aligning on the same plane with the hub. How much dish, or offset, varies from wheel to wheel, depending on its use. The heavier a wheel and the load it carries, the more dish must be built into it. The wagon's load pushes the center of the hub outward, and without sufficient dish, the wheel could break down. A more precise definition of dish is the convexity of a wheel.

We then learned about the different types of hubs, metal and wood. Wood hubs are generally made of elm, madrone, or yew — homogenous hardwoods that don't split easily. The hub is banded front and back by iron collars that are put on cold, so they are not bound as tight as the outer wheel rim, which is put on hot. The drying time for hub rounds is generally one year per inch of thickness. Hubs can



require as long as ten years to dry properly. A hole about an inch in diameter drilled through the hub center can speed up the process, but it still takes years for a wooden wheel hub to dry correctly. Once the dried hub has been turned to shape, it is mortised to accept the spoke.

Spokes are best made from oak, hickory, or ash. They are teardrop-shaped, and the narrow end, or neck, fits into the hub, where it helps absorb shock, much like a hammer handle.

The *felloe* is the exterior wood arch that is supported by the spokes and belted by the tyre. Felloes were traditionally made from locally available hardwood. They can be either cut or bent. Usually a cut felloe holds just two spokes. If a felloe is bent, its arch can encompass half the entire wheel rim. The felloes are hammered on to the spokes. Everything is made to fit tight.

The final piece is the iron rim, or tire. Once the felloes are attached and everything is as snug as possible, it is necessary to measure the outside circumference of the wheel. The tool used, a traveler, is a hand-held wheel, usually 24 inches in circumference. The tyre is actually made a bit smaller than the exterior circumference of the wheel, forge-welded to size, then heated so it expands enough to slip over the wheel. Upon cooling, it shrinks and so draws the whole wheel tight together.

Then, the practice . . .

THE HANDS-ON PART OF the workshop started the next morning. Almost everyone wanted to make a large (30-inch) wagon wheel rather than a smaller wheel suitable for a wheelbarrow. Rob introduced some hand tools traditionally used in wheel making, including a spoke pointer and a tenon cutter. A spoke pointer is like a large pencil sharpener. It puts a blunt point on the outside end of the spoke to help center the tenon cutter. The tenon cutter is adjustable to the desired diameter. It leaves a strong flat shoulder on the spoke to help absorb shock. My only disappointment with the class came when I realized there was no way we could do all the work with hand tools in the time allotted. We were forced to use power tools — band saw, lathe, sander, router, and planer.

Rob laid out the pattern for the wheel on a piece of hardboard. By drawing a portion of the wheel to scale, he was able to extrapolate the critical measurements for its components: the diameter of the hub, the length and diameter of the spokes, and the size and curve of the felloes. From this plan, we made patterns and started cutting wood. (I won't try to go into any of the math involved, mainly because Rob didn't and I want to keep this as simple as possible for my own benefit. All the measurements and ratios have explanations. People who are really interested might consider a more advanced class.)

It was a good group of students, mostly older— I know, that's a relative term — who had nearly all worked with power equipment before. It only took some minimal instruction before we really turned into a production shop. One person marked the 2-inch thick boards with our felloe pattern and others cut them out on the band saw. The spokes were trimmed to the correct length, then routed to shape. (We learned that ready-made spokes are available from several sources; among the best are Amish suppliers in Pennsylvania.)

While some of us were cutting and sawing, others were turning hubs on the lathe. Hubs started out as two 4 x 6-inch pieces of poplar, glued together. Once the corners were knocked off with the band saw, we were ready to turn. This was my first experience with a lathe. After a rough start I did get the hang of it, but unfortunately, by that time my hub was slightly smaller in diameter than the others. Not a problem in itself except that a smaller diameter hub meant that all other measurements were out the window. My spokes had to be slightly shorter and my felloes had to be adjusted down to size with a large disc sander. I ended up with a custom instead of a "production" wheel!

Clockwise, from top left
Gary making adjustments for smaller hub
Carrying the tyre
Cooling a small wheel immediately after rimming, to prevent burning
Tyring the wheel
Photos: S.Gawecki, D.Vorwaller

When all the parts were made, we began putting our wheels together. We mortised out the hub with a router, then used a chisel to square the holes for the spokes, to get a tight fit. We pounded the spokes into the hub, then fitted the felloes onto the ends of the spokes. Some adjustments were necessary (especially on mine) to get the felloes to mate up well. Traditionally, a hand plane would be used to even up the edges; we used a power disc sander.

The felloes are fastened together using either dowels, more traditional, or "biscuits," more modern. When everything was snug, we joined the felloes with biscuits, then wrapped a ratchet strap around the wheel, to ensure that all was as tight as possible. Rob used a traveler to measure the circumference of the tightened wheel, then transferred this measurement to the strip of flat steel that would become the tyre, taking care to mark the side of the steel with the transferred measurements as the inside of the tyre.

Then, the baptism by fire!

ON THE FOLLOWING SUNDAY, we returned to rim our wheels. It was a pretty interesting day. The tire is actually forge-welded a bit smaller than the wheel, then heated to expand to the size of the wheel. The heated tyre is slipped over the wheel. When it shrinks upon cooling, it brings the whole wheel together tight. For me, this was the most interesting part of the class: heating the steel rim in fire to expand it enough to slip over the wheel, then dousing it with water to shrink it on sounded like real smithing! Fitting the rims was the most fun part of the whole class, especially for students with blacksmithing experience.

First we built a large fire on the ground. When it was going well we spread it out so the entire rim could be heated as evenly as possible. (Rob had already welded the rims together for us, so no forge welding was necessary, although I hope to do that in the future). Three bricks were placed in the fire to support the rim. When the rim was in position, we added more wood, enough to cover it, in order to bring it to an even heat. To check whether a rim is ready, you touch it with a hickory stick. If the steel still feels rough, it ain't soup yet. If the stick slides smoothly, the steel is at the right temperature and has expanded.

To attach the rim, the wheel is positioned on a piece of plywood over a garbage can. The plywood has a hole in the middle to accommodate the hub, and the wheel rests level, outside facing down, so any burn marks will be on its back side. The wheel is also hosed down to protect it from burning when the hot rim is applied.

When the "soup" is ready and the steel rim has reached the desired temperature, it is removed from the fire with a pair of long-handled tongs. (The longer the better, I discovered, after singing the hair off the back of my hand!) The rim is set on the wheel and immediately, before heat is lost, pounded down onto the wheel. (We had to reheat two rims because the fit was too tight.) We pressed Rob to give us a formula or ratio for how much smaller the rim should be, allowing for heat expansion. The closest we got was one and a half times the tyre thickness — and also allow for any gaps between felloes, spoke ends, and hubs . . . a somewhat subjective formula. Like most things, experience, trial, and error are the keys to success.

The wheel-making class was a totally enjoyable and informative experience, made even more so by a knowledgeable and humorous instructor. I heartily recommend it to anyone interested in smithing, woodworking, or just in gaining some historical perspective. Rob also hopes to teach a future class on making horse-drawn vehicles. Once again, I would like to express my thanks to the guild for providing this opportunity to add to my period-appropriate knowledge. ♦

Editor's note: Gary Lewis was recently the recipient of a Merlyn Troska Scholarship sponsored by the Fort Vancouver Trades Guild. He used it for this wheel-making class.

References

- *The Wheelwright's Shop*, by George Stuart (Cambridge University Press: 1993, originally published in 1923
- *Making a Whee*l, by John Wright and Robert Huford, a manual available on line at http://www.countryside.gov.uk/Publications/articles/Publication_tcm2-7488.asp

Sources for Illustrations, page 8
Left: *Merriam Webster's Collegiate Dictionary, 10th Ed.*
Right: *The Wheelwright's Shop,* by George Stuart

News from the Fort

THE SCHOOL KIDS have been coming in quite frequently this fall and I hope everyone is enjoying interacting with them during their visits. I really appreciate all the hard work and dedication everyone gives to the programs.

The new web site for the park is up and running after much hard work by Chief Ranger Greg Shine (excellent job Greg). This effort is still a work in progress and any helpful suggestions are welcome. When you first visit the site it may seem a little daunting, but be persistent. If you are looking for information to help in your interpretive program follow these links.

Go to the park website: *www.nps.gov/fova*
Click on "History & Culture"
Click on "Collections"
Click on "Research"
Click on "On-line publications"

This will take you to a page where you can find things like the Historic Structures Reports. If you know what you are looking for —"Cultural Landscape Report" for example —you can just type that into the search box. Look in the NEWS section for links to newsletters (including *The Forge & Plane*) and up-to-date events. The site is really excellent and has a world of information for visitors, staff, and volunteers. When you see Greg around the place, let him know how much you appreciate his work on this.

Also, as many of you know, the park library was recently moved over to the cultural resources building to put it more in line with NPS library management policies. The library is now referred to as the ARC (Archive & Research Center). We are developing a small collection of applicable references in the ITS spaces that will be more easily accessible for interpretive research. This is called the IRC (Interpretive Research Center). See one of us to find out more. See you at the Fort! ♦ — Bill

Bill DeBerry, Historic Programs Coordinator

Notes from the President

FELLOW GUILD MEMBERS — We write with great sadness: tomorrow we will attend the funeral of honorary guild member Merlyn Troska who passed away on November 7. He was a very special part of our organization and one of its founding members. He will be missed more than I have words to express.

Looking ahead, it seems that the park will be searching for ways to increase their revenue, which brings opportunities and pitfalls. We will work closely with them and keep you informed as discussions are held and your approval and support is requested.

A very special thanks to Shelton Browder for the workshop he put on for us and for his promise to return next year. He is our third instructor from the Anderson Blacksmith Shop, in Colonial Williamsburg. These workshops have been an annual event for over ten years, and they still never fail to excite and amaze. For those of you who could not make it, you really missed some sweet forge work backed up with clear explanations as to the "why" as well as the "how" of it all. The volunteers who set up and took down made it very easy for Shel to just step in and go to work. A fresh breakfast buffet was there every morning. We had a very positive cash flow over and above our out-of-pocket costs. It can't get any better than that. Thanks to everyone for your efforts in behalf of the guild.

In the summer, the board decided that an increase in annual dues from $5 to $10 was necessary to keep this organization on a healthy financial footing. During the general membership meeting, we were authorized to proceed with our decision. Thanks to Bob Race, our bylaw amendment retained the language regarding Honorary and Patron members in its original form. Bob kept us from messing up big time. The best of the holiday season to one and all. ♦ — Ike

Ike Bay, Guild President

FORT CALENDAR

Upcoming Holiday Events

McGloughlin House Candlelight Tour
Sunday, December 3,
4:30 PM to 7:30 PM

Christmas at Fort Vancouver
Saturday, December 9,
10:00 AM to 4:00 PM

For more information, please contact

Fort Vancouver National Historic Site
612 E. Reserve Street
Vancouver, WA 98661
Visitor Center: 360-816-6230
www.nps.gov/fova/home.htm

CHECK THIS OUT!

http://members.tripod.com/tomahawks-r-tatca/index.htm

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THE forge & plane

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